

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of the claims in the application.

Listing of Claims:

1. (Currently Amended) A process for recovering at least one metal oxide from a titaniferrous or aluminaferrous mixture comprising: (A0) melting cast iron into molten cast iron; (A01) adding said titaniferrous or aluminaferrous mixture to the molten cast iron; (A) smelting the titaniferrous or aluminaferrous mixture in the presence of the molten cast iron a reducing agent to produce a molten slag whereby substantially the whole of the iron present in the titaniferrous or aluminaferrous mixture is reduced to molten metallic iron in the molten slag, wherein the reducing agent comprises molten cast iron and the metallic iron is steel; (B) adding to the molten slag an alkali, wherein the alkali is a carbonate; (C) isolating molten iron from the molten slag to produce a residual slag; and (D) recovering the metal oxide from the residual slag.
2. (Original) The process of claim 1 wherein the titaniferrous mixture is ilmenite, rutile or perovskite.
3. (Original) The process of claim 1 wherein the aluminaferrous mixture is an aluminum mineral or ore or red mud.
4. (Original) The process of claim 3 wherein the aluminaferrous mixture is bauxite or red mud.
5. (Original) The process of claim 1 wherein the metal oxide is one or more of alumina, TiO₂, Fe₂O₃ and SiO₂.
6. (Original) The process of claim 1 further comprising: recovering one or more metal hydroxides.
7. (Original) The process of claim 1 wherein the at least one metal oxide is at least two metal oxides being TiO₂ and Al₂O₃.
8. (Cancelled)
9. (Cancelled)
10. (Previously Presented) The process of claim 1 wherein step (A) is carried out in a molten cast iron bath.
11. (Previously Presented) The process of claim 1 wherein the metallic iron is 0.8 to 1.0% C steel.

12. (Cancelled)
13. (Previously Presented) The process of claim 1 wherein step (A) comprises smelting the mixture in the presence of the reducing agent and lime.
14. (Cancelled)
15. (Previously Presented) The process of claim 1 wherein the carbonate is a carbonate of a group Ia or IIa metal or a mixture thereof.
16. (Previously Presented) The process of claim 15 wherein the carbonate is selected from the group consisting of sodium carbonate and potassium carbonate.
17. (Original) The process of claim 1 wherein the titaniferrous mixture is ilmenite and step (A) comprises smelting the mixture in the presence of up to 50% by stoichiometric proportion of an alkali/alumina mixture or sodium aluminate.
18. (Original) The process of claim 1 wherein in step (C), the molten iron and residual slag are tapped separately.
19. (Original) The process of claim 18 wherein during tapping of residual slag, alkali is added by dosing.
20. (Original) The process of claim 1 wherein step (D) comprises: (D1) adding to the residual slag an aqueous solution; (D2) separating a metallate solution from a metallate residue; and (D3) isolating the metal oxide from the metallate solution and/or from the metallate residue.
21. (Original) The process of claim 20 wherein step (D3) comprises: (D3a) precipitating metal hydroxide from the metallate solution.
22. (Original) The process of claim 21 wherein step (D3a) includes: bubbling CO₂ gas through the metallic solution.
23. (Original) The process of claim 22 wherein the CO₂ gas is generated during step (A).
24. (Original) The process of claim 20 wherein step (D3) comprises: (D3b) acid leaching the metallate residue to produce an acid leachate; (D3c) selectively precipitating from the acid leachate a hydrated salt of the metal oxide; and (D3d) converting the hydrated salt into the metal oxide.
25. (Original) The process of claim 24 wherein step (D3b) comprises: (D3b1) acidifying the metallate residue to produce a slurry; (D3b2) hydrolysing the slurry; and (D3b3) separating the metallate solution from an insoluble residue.

26. (Withdrawn) A method for recovering titanium dioxide from a titanium oxide-containing composition comprising: (a) roasting the composition in the presence of alkali metal carbonate and an alumina-containing material to produce a roasted mass; and (b) recovering titanium oxide from the roasted mass.

27. (Withdrawn) The method of claim 26 wherein the titanium oxide-containing composition is ilmenite, rutile or perovskite.

28. (Withdrawn) The method of claim 26 wherein the alkali metal carbonate is sodium and/or potassium carbonate.

29. (Withdrawn) The method of claim 26 wherein the alumina-containing material is alumina or NaAlO_2 .

30. (Withdrawn) The method of claim 26 wherein step (b) comprises: (b1) adding to the roasted mass an aqueous medium to produce an aqueous solution and an insoluble residue.

31. (Withdrawn) The method of claim 30 further comprising: (b2) acid leaching the insoluble residue to produce an acid leachate; and (b3) recovering titanium oxide from the acid leachate.

32. (Withdrawn) The method of claim 26 further comprising: (c) recovering alumina-containing material from the aqueous solution.

33. (Withdrawn) The method of claim 32 further comprising (d) recovering carbon dioxide generated in step (a); and (e) converting the carbon dioxide into an alkali metal carbonate.

34. (Cancelled)